

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

Mark Franklin DAVIS

Application No.: 10/591,374

Filed: August 31, 2006

For: MULTICHANNEL AUDIO CODING

Group Art Unit: 2626

Examiner: Borsetti, Greg

Confirmation No.: 8002

**APPEAL BRIEF**

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir,

The following appeal brief is submitted pursuant to a Notice of Appeal filed on 21 January 2011 for the above-identified application.

**REAL PARTY IN INTEREST**

The real party in interest for the above-identified application is Dolby Laboratories Licensing Corporation (“Dolby”).

For more than four decades, Dolby and its affiliates have been innovators in high-quality audio. In that time, its ubiquitous technologies have been incorporated in more than three billion licensed products for cinema, broadcast, home audio systems, cars, DVDs, headphones, games, televisions, and personal computers, among other things. Dolby’s innovation is well celebrated. For example, Dolby’s affiliates or their employees have been honored by a National Medal of Technology and Innovation, nine Academy Awards® from the Academy of Motion Picture Arts and Sciences, nine Emmy® Awards from the Academy of Television Arts & Sciences, and a Technical Grammy® from the Recording Academy. Dolby’s affiliates have over 1200 employees striving to continue its legacy of innovation, including technicians, engineers, researchers and scientists, all of whom are vital to Dolby’s patent process.

**RELATED APPEALS AND INTERFERENCES**

None

**STATUS OF CLAIMS**

Claims 63-74 are pending.

Claims 63-74 stand rejected under 35 U.S.C. §101 and are hereby appealed.

Claims 63-67, 70-71, and 74 stand rejected under 35 U.S.C. §102(a) and are hereby appealed.

Claims 68-69 and 72-73 stand rejected under 35 U.S.C. §103(a)<sup>1</sup> and are hereby appealed.

STATUS OF AMENDMENTS

No amendments have been made subsequent to the final office action mailed on 23 August 2010.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 63 recites a method for decoding M encoded audio channels representing N audio channels, where N is two or more, and a set of one or more spatial parameters, the method comprising:

- a) receiving said M encoded audio channels (*See, e.g.*, Figures 7-9 and Specification, 54:29-31) and said set of spatial parameters (*See, e.g.*, Specification, 55:5-7),
- b) deriving N audio signals from said M encoded channels, wherein each audio signal is divided into a plurality of frequency bands, wherein each band comprises one or more spectral components (*See, e.g.*, Figures 8-9, before the Inverse Filterbank, Specification, 12:3-7), and

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<sup>1</sup> Dolby notes that the Examiner rejected Claims 68-69 and 73 under 35 U.S.C. 102(a) as being anticipated by Faller in view of Baumgarte in view of Broadie, and Claim 72 under 35 U.S.C. 102(a) as being anticipated by Faller in view of MPEP 2144.03. The Examiner's statement of these rejections is neither consistent nor clear. Because these rejections are listed under a heading of "Claim Rejections – 35 USC § 103" and each cite two or more references, it appears that the Examiner intended these rejections to be under 35 USC § 103(a) and not 35 USC § 102(a). Accordingly, the Dolby treats the rejections of Claims 68-69 and 72-73 as having been issued under 35 USC § 103(a) as being allegedly unpatentable as obvious over the respective combinations of references.

c) generating a multichannel output signal from the N audio signals and the spatial parameters (*See, e.g.*, Figures 8-9, PCM channels 1-N),

whereby M is two or more (*See, e.g.*, Specification, 54:30),

at least one of said N audio signals is a correlated signal derived from a weighted combination of at least two of said M encoded audio channels (*See, e.g.*, Figure 9, output of Decorrelator, Specification, 54:28 – 56:22),

said set of spatial parameters includes a first parameter indicative of the amount of an uncorrelated signal to mix with a correlated signal (*See, e.g.*, Specification, 55:28 – 56:6) and

step c) includes deriving at least one uncorrelated signal from said at least one correlated signal, and controlling the proportion of said at least one correlated signal to said at least one uncorrelated signal in at least one channel of said multichannel output signal in response to one or ones of said spatial parameters, wherein said controlling is at least partly in accordance with said first parameter (*See, e.g.*, Specification, 56:5-13).

Independent claim 74 recites an apparatus comprising means adapted to carry out each of the steps of any one of the methods of claims 63 – 73, including

a) means adapted to carry out receiving said M encoded audio channels and said set of spatial parameters (*See, e.g.*, Figures 1, 4, and 6-9, items 2, 4, 20, and Specification, 54:29-31 and 55:5-7 for exemplary structure),

b) means adapted to carry out deriving N audio signals from said M encoded channels, wherein each audio signal is divided into a plurality of frequency bands, wherein each band comprises one or more spectral components (*See, e.g.*, Figures 7-9, items 20, 26-28 and 32-34, and Specification, 12:3-7 for exemplary structure), and

c) means adapted to carry out generating a multichannel output signal from the N audio signals and the spatial parameters (*See, e.g.*, Figures 8-9, items 46 and 48),

whereby M is two or more (*See, e.g.*, Figures 7-9, input to item 20, and Specification, 54:30 for exemplary structure),

at least one of said N audio signals is a correlated signal derived from a weighted combination of at least two of said M encoded audio channels (*See, e.g.*, Figures 7-9, items 46 and 48, and Specification, 54:28 – 56:22 for exemplary structure),

said set of spatial parameters includes a first parameter indicative of the amount of an uncorrelated signal to mix with a correlated signal (*See, e.g.*, Specification, 55:28 – 56:6 for exemplary structure) and

the means adapted to carry out generating includes means adapted to carry out deriving at least one uncorrelated signal from said at least one correlated signal, and controlling the proportion of said at least one correlated signal to said at least one uncorrelated signal in at least one channel of said multichannel output signal in response to one or ones of said spatial parameters, wherein said controlling is at least partly in accordance with said first parameter (*See, e.g.*, Figures 7-9, items 46, 48, 50, 52, and Specification, 54:28 – 56:22 for exemplary structure).

**GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

A. In the final office action mailed 23 August 2010, claims 63-74 were rejected under 35 U.S.C. §101 as allegedly directed to non-statutory subject matter, and are hereby appealed.

B. In the final office action mailed 23 August 2010, claims 63-67, 70-71, and 74 were rejected under 35 U.S.C. §102(a) as being allegedly anticipated by Faller et al. (NPL document “Binaural Cue Coding—Part II: Schemes and Applications) (hereinafter “Faller”), and are hereby appealed.

C. In the final office action mailed 23 August 2010, claims 68-69 and 73 were rejected under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious<sup>2</sup> over Faller in view of U.S. Patent Application Publication Number 2003/0236583 A1 to Baumgarte et al. (hereinafter “Baumgarte”) in view U.S. Patent Number 5,394,472 to Broadie (hereinafter “Broadie”), and are hereby appealed.

D. In the final office action mailed 23 August 2010, claim 72 was rejected under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious<sup>3</sup> over Faller in view of MPEP 2144.03, and is hereby appealed.

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<sup>2</sup> See note 1, *supra*.

<sup>3</sup> See note 1, *supra*.

**ARGUMENT**

**I. Summary of Arguments**

Each of the foregoing grounds of rejection is erroneous and should be reversed.<sup>4</sup> Certain errors made by the Examiner alone would justify the reversal of all rejections and obviate the need for the Board to assess Dolby's additional arguments.

The rejection of claims 63-74 under 35 U.S.C. § 101 as allegedly "being nonstatutory" should be reversed because the Examiner relies solely on the Machine-or-Transformation test counter to controlling Supreme Court precedent in *Bilski*. The rejection of claims 63-74 under 35 U.S.C. § 101 for allegedly being solely directed to a mathematical algorithm without a practical application should be reversed because it fails to properly apply controlling Supreme Court precedent in *Diehr* and *Bilski* and U.S. Court of Appeals for the Federal Circuit (hereinafter "Federal Circuit") precedent in *Arrhythmia Research* and *Research Corporation Technologies* (hereinafter "RCT"). The Examiner also ignores that the claimed inventions have practical application to and address a need in the audio signal processing art to improve audio signal processing for high-quality audio and surround-sound in cinema, broadcast, home audio systems, cars, DVDs, headphones, games, televisions, and personal computers. In both of the preceding rejections under 35 U.S.C. § 101, the Examiner erroneously analyzed apparatus claim 74 as a process claim and failed to perform the required analysis under 35 U.S.C. § 112, ¶ 6 of the means plus function limitations in claim 74. For the above reasons, all of the rejections under 35

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<sup>4</sup> Dolby notes that claims substantially identical to those on appeal have been allowed by the European Patent Office and issued as European Patent EP 1914722 B1 on 29 April 2009.

U.S.C. § 101 should be reversed.

All of the rejections under 35 U.S.C. §§ 102-103 (rejections B-D above as listed in the Grounds of Rejection to be Reviewed on Appeal) should be rejected because the Examiner misunderstands the primary reference, Faller. Faller does not teach or suggest certain limitations of independent claim 63, which by virtue of dependency or incorporation are present in each of claims 63-74. In particular, Faller fails to teach or suggest at least the following limitations present in each of the pending claims:

- (1) at least one of said N audio signals is a correlated signal derived from a weighted combination of at least two of said M encoded audio channels;
- (2) said set of spatial parameters includes a first parameter indicative of the amount of an uncorrelated signal to mix with a correlated signal; and
- (3) step c) includes deriving at least one uncorrelated signal from said at least one correlated signal, and controlling the proportion of said at least one correlated signal to said at least one uncorrelated signal in at least one channel of said multichannel output signal in response to one or ones of said spatial parameters, wherein said controlling is at least partly in accordance with said first parameter.

The Examiner fails to point to anything in any of the secondary references (Baumgarte, Broadie, or MPEP 2144.03) that remedies these deficiencies of Faller, and the Examiner fails to provide any justification for why it would have been obvious for one of ordinary skill in the art to modify the asserted combinations of references to include the missing limitations. The rejections of (1) claims 63-67, 70-71, and 74 under 35 U.S.C. § 102(a) as



allegedly anticipated by Faller; (2) claims 68-69 and 73 under 35 U.S.C. § 103(a) as allegedly unpatentable over Faller in view of Baumgarte in view of Broadie; and (3) claim 72 under 35 U.S.C. § 103(a) as allegedly unpatentable over Faller in view of MPEP 2144.03 should therefore be reversed.

The foregoing reasons alone provide sufficient bases to reverse all of the rejections under 35 U.S.C. §§ 102 and 103, and no further analysis by the Board should be necessary to reverse those prior art rejections. Additional arguments are provided in Sections IV-VI below for completeness and to preserve the arguments for further appeal, should that become necessary, but need not be considered by the Board to reverse the prior art rejections in light of the above arguments. In particular, Section IV explains why Faller also fails to teach certain additional limitations present in certain dependent claims subject to the above rejection under 35 U.S.C. § 102(a). Section V provides additional reasons why the rejection of claims 68-69 and 73 under 35 U.S.C. § 103(a) as allegedly unpatentable over Faller in view of Baumgarte in view of Broadie should be reversed; specifically that the combination of Faller, Baumgarte, and Broadie does not disclose or suggest all of the limitations of any of claims 68-69 and 73, and the Examiner has not provided a rational underpinning for the asserted combination of Faller, Baumgarte, and Broadie. Section VI provides additional reasons why the rejection of claim 72 under 35 U.S.C. § 103(a) as allegedly unpatentable over Faller in view of MPEP 2144.03 should be reversed; specifically that the combination of Faller in view of MPEP 2144.03 does not disclose or suggest all of the limitations of claim 72, the Examiner has improperly relied on MPEP 2144.03, and the Examiner has not provided a rational underpinning for the asserted combination of Faller in view of MPEP 2144.03.

For the foregoing reasons, all of the rejections of the pending claims should be reversed and remanded to the Examiner so that a Notice of Allowance may promptly be issued with respect to claims 63-74.

**II. The Rejections of Claims 63-74 under 35 U.S.C. § 101 Should Be Reversed Because Each of Claims 63-74 Recites Statutory Subject Matter**

**A. The Rejection of Claims 63-74 under 35 U.S.C. § 101 as Allegedly Failing to Meet the Machine-or-Transformation Test Should Be Reversed Because the Examiner Ignores Controlling Supreme Court Precedent in Issuing a Rejection Based Exclusively on the Machine-or-Transformation Test**

The Examiner rejected claims 63-74 under 35 U.S.C. § 101 as allegedly “being nonstatutory.” The Examiner stated that “one of the tests used to determine patent eligible subject matter for process claims is the Machine or Transformation (MoT) test where a method claim must (1) be tied to another statutory class or (2) transform underlying subject matter to a different state or thing.” Final Office Action at 2-3. However, the Examiner improperly applies the Machine or Transformation test as the *sole* test in issuing this rejection. For that reason alone, this rejection should be reversed.

Furthermore, the *Interim Bilski Guidance* relied upon by the Examiner is ambiguous and fails to capture the proper analytical rubric set out by the Supreme Court in *Diehr* and *Bilski* and applied by the Federal Circuit in cases such as *Arrhythmia Research* and *RCT*, as more fully discussed in Section III below. The Board should take this opportunity to issue a precedential opinion reversing this rejection and clarifying the proper analytical rubric for the Examining Corps.

**1. The rejection of Claims 63-74 under 35 U.S.C. § 101 solely for allegedly failing to meet the machine-or-transformation test is directly counter to the Supreme Court's holding in *Bilski* and should be reversed for that reason alone**

Although the Examiner initially stated that the Machine or Transformation test is “one of the tests used,” he effectively applied it as the *sole* test to support this rejection by concluding, without further information that:

None of the recited method steps have or require a machine for performing the step and one of ordinary skill in the art could have performed the method without the use of a machine. Furthermore, the claims do not provide a statutory transformation. If no transformation occurs, the claim(s) should positively recite the other statutory class to which it is tied to qualify as a statutory process under 35 U.S.C. 101.

Final Office Action at 3. Beyond this conclusory statement, the Examiner provides no other justification for this rejection under 35 U.S.C. § 101. Thus, this rejection under 35 U.S.C. § 101 is based solely on the Machine or Transformation test.

By applying the Machine or Transformation test as the sole basis for the rejection, the Examiner's analysis directly conflicts with controlling Supreme Court precedent in *Bilski*, which held that “[t]he machine-or-transformation test is not the sole test for deciding whether an invention is a patent-eligible process.” *Bilski v. Kappos*, 130 S. Ct. 3218, 3226 (2010). In *Bilski*, the Supreme Court rejected the formulation of the Federal Circuit that “an invention is a ‘process’ only if: ‘(1) it is tied to a particular machine, or apparatus, or (2) it transforms a particular article to a different state or thing.’” *Id.* at 3225 (quoting *In re Bilski*, 545 F.3d 943, 954 (Fed. Cir. 2008)).

The Supreme Court reaffirmed in *Bilski* that “the Court's precedents provide three exceptions to § 101's broad patent-eligibility principle: ‘laws of nature, physical phenomena, and abstract ideas.’” *Id.* at 3225 (2010) (citing *Diamond v. Chakrabarty*, 447

U.S. 303, 309 (1980). The Court made clear that the three specific exceptions stated were the only exceptions available.

Any suggestion in this Court's case law that the Patent Act's terms deviate from their ordinary meaning has only been an explanation for the exceptions for laws of nature, physical phenomena, and abstract ideas. See *Parker v. Flook*, 437 U.S. 584, 588-589, 98 S. Ct. 2522, 57 L. Ed. 2d 451 (1978). This Court has not indicated that the existence of these well-established exceptions gives the Judiciary *carte blanche* to impose other limitations that are inconsistent with the text and the statute's purpose and design. Concerns about attempts to call any form of human activity a "process" can be met by making sure the claim meets the requirements of § 101.

*Id.* at 3226. The Court found "no 'ordinary, contemporaneous, common meaning' of the definitional terms 'process, art or method' [in 35 U.S.C. § 100(b)] that would require these terms to be tied to a machine or to transform an article." *Id.* On this basis, the Court rejected the Federal Circuit's machine-or-transformation test as the sole test for what constitutes a "process." *Id.*

The Examiner therefore clearly erred in issuing this rejection under 35 U.S.C. § 101 on the sole basis that the rejected claims allegedly fail to meet the Machine or Transformation test.<sup>5</sup> For this reason and for the additional reasons stated in Sections II.B and II.C below, this rejection of claims 63-74 should be reversed.

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<sup>5</sup> Dolby does not concede that the claims on appeal would fail the Machine or Transformation test, even if it were appropriate to apply it as the sole test. For example, each of the pending claims required "deriving N audio signals from said M encoded channels," which clearly requires transforming the M encoded channels into N audio signals. Moreover, each of the currently pending claims recites statutory subject matter under controlling Supreme Court and Federal Circuit precedent as more fully discussed in Section II.B below.

**2. The Board Should Issue a Precedential Opinion Reversing the Rejections under 35 U.S.C. § 101 to clarify ambiguity in the *Interim Bilski Guidance* relied on by the Examiner and to provide unequivocal guidance to the Examining Corps that process claims seeking to patent an *application* of a law of nature or mathematical formula, such as the audio signal processing claims in the instant appeal, recite patentable subject matter whether or not they satisfy the machine-or-transformation test.**

In support of this rejection, the Examiner stated:

As for guidance to areas of statutory subject matter, see 35 U.S.C. 101 Interim Guidelines<sup>6</sup> (with emphasis of the Clarification of “processes” under 35 USC 101); As an example, the claims(s) could identify the apparatus that accomplishes the method steps or positively recite the subject matter that is being transformed.

Final Office Action at 3. However, the *Interim Bilski Guidance* introduces ambiguity to the patentable subject matter analysis that results in rejections, such as the present rejection, which are inconsistent with controlling Supreme Court and Federal Circuit precedent.

The *Interim Bilski Guidance* provides factors to consider in determining whether a claim is directed to an abstract idea and is therefore not patent-eligible under 35 U.S.C. § 101. Under the *Interim Bilski Guidance* factors that weigh in favor of patent eligibility satisfy the criteria of the machine-or-transformation test or provide evidence that the abstract idea has been practically applied, and factors that weigh against patent-eligibility neither satisfy the criteria of the machine-or-transformation test nor provide evidence that the abstract idea has been practically applied. A summary sheet of these factors is also attached to this memorandum. The machine-or-transformation test remains an investigative tool and is a useful starting point for determining whether a claimed invention is a patent eligible process under 35 U.S.C. § 101. The *Interim Bilski Guidance* provides additional factors to aid in the determination of whether a claimed method that fails the machine-or-

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<sup>6</sup> In a telephone call with Dolby’s prior counsel, Thomas A Gallagher, Reg. No. 24,815, on December 9, 2010, the Examiner confirmed that this reference is intended to be a reference to the July 27, 2010 “*Interim Bilski Guidance*,” which is available at [http://www.uspto.gov/patents/law/exam/bilski\\_guidance\\_27jul2010.pdf](http://www.uspto.gov/patents/law/exam/bilski_guidance_27jul2010.pdf).

transformation test is nonetheless patent eligible (i.e., is not an abstract idea), and also whether a claimed method that meets the machine-or-transformation test is nonetheless patent-ineligible (i.e., an abstract idea). Since claims directed to abstract ideas were not patentable prior to *Bilski*, subject matter eligibility outcomes based on the *Interim Bilski Guidance* are not likely to change in most cases. The difference is that in some rare cases, factors beyond those relevant to machine-or-transformation may weigh for or against a finding that a claim is directed to an abstract idea.

*Interim Bilski Guidance* at 1. The *Interim Bilski Guidance* continues to place primary emphasis on the application of the machine-or-transformation test and limits a result inconsistent with that test to “some rare cases.” Not only did the Supreme Court reject the machine-or-transformation test as the only test for patentability of processes in *Bilski*, the Court also reaffirmed that:

Finally, in *Diehr*, the Court established a limitation on the principles of *Benson* and *Flook*. . . . *Diehr* explained that while an abstract idea, law of nature, or mathematical formula could not be patented, “an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of protection.”

*Bilski*, 130 S. Ct. at 3226, 3230 (2010) (citing *Diamond v. Diehr*, 450 U.S. 175, 177, 187 (1981)).

The concept of practical application is listed as just another factor in the *Interim Bilski Guidance*. Without more specific guidance that claims that state a practical application of a law of nature or mathematical formula to a known structure or process should not be rejected by Examiners under 35 U.S.C. § 101, the *Interim Bilski Guidance* retains ambiguity that should have been resolved after *Bilski*. A clear rubric is provided in the recent Federal Circuit decision in *RCT* for applying the controlling precedent in *Bilski* to process claims. In *RCT*, the Federal Circuit found the subject matter to be “a process for rendering a halftone image. As a process, the subject matter qualifies under both the

categorical language of section 101 and the process definition in section 100.” *Research Corporation Technologies, Inc. v. Microsoft Corporation*, 627 F.3d 859, 868 (Fed. Cir. 2010). Accordingly, the Federal Circuit proceeded to examine the Supreme Court’s three exceptions.<sup>7</sup> Noting that “[t]he Supreme Court did not presume to provide a rigid formula or definition for abstractness,” the Federal Circuit did not “presume to define ‘abstract’ beyond the recognition that this disqualifying characteristic should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act.” *Id.* In that context, the Federal Circuit found nothing abstract in the claims directed to “methods (statutory ‘processes’) for rendering a halftone image of a digital image against a blue noise mask.” *Id.* Applying this rubric in a precedential Board decision would provide helpful guidance to the Examining Corps that is lacking in the *Interim Bilski Guidance*.

Dolby therefore respectfully requests that the Board issue a precedential opinion reversing both of the rejections under 35 U.S.C. § 101 and clarifying that process claims seeking to patent an *application* of a law of nature or mathematical formula, such as the audio signal processing claims in the instant appeal, recite patentable subject matter whether or not they satisfy the Machine or Transformation test. This conclusion is fully supported by controlling Supreme Court and Federal Circuit precedent as discussed in greater detail in Section II.B below. However, clarification of the *Interim Bilski Guidance* is necessary to conform the guidance to the Examining Corps to this controlling precedent.

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<sup>7</sup> In *RCT*, only the abstract idea exception was at issue. *Id.*

**B. The Rejection of Claims 63-74 under 35 U.S.C. § 101 as Allegedly Being Solely Directed to a Mathematical Algorithm Without Practical Application Should Be Reversed Because Each of Claims 63-74 States a Practical Application and is not Directed to an Abstract Idea**

The Examiner also issued a second ground of rejection of claims 63-74 under 35 USC § 101 “for being solely directed to a mathematical algorithm without a practical application,” alleging that “[t]he claimed spatial decoding does nothing more than manipulate the abstract audio signals.” Final Office Action at 3. The rejection refers to and quotes a portion of MPEP 2106.02:

If the “acts” of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter. *Gottschalk v. Benson*, 409 U.S. 63, 71-72, 175 USPQ 673, 676 (1972). Thus a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

The rejection is erroneous in concluding, without stating reasons, that the claims are solely directed to a mathematical algorithm without a practical application. *Benson* involved a “pure” algorithm—the claims were directed to converting binary-coded decimal numerals into pure binary code. *See Benson*, 409 U.S. at 71-72. Contrary to the Examiner’s assertion, Dolby’s claims are not directed to a pure algorithm—they do not manipulate only numbers, abstract concepts or ideas; nor do they manipulate signals representing numbers, abstract concepts or ideas. The currently pending claims 63-73<sup>8</sup> are directed to a method for generating a multichannel audio output signal in response to

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<sup>8</sup> As discussed more fully in Section II.C below, claim 74 is directed to “[a]n apparatus comprising means adapted to carry out each of the steps of any one of the methods of claims 63-73.” Because claim 74 is an apparatus claim and not a claimed process, the Examiner has applied the incorrect law to claim 74 and this rejection of claim 74 should also be reversed.



encoded audio channels and spatial parameters. The rejection wrongfully ignores the claims' practical applications in concluding that "[t]he claimed spatial decoding does nothing more than manipulate the abstract audio signals." These claims manipulate audio signals to achieve a result that has a practical application, as discussed more fully in Section II.B.2 below. Therefore, even under the test recited by the Examiner, each of the currently pending claims recites statutory subject matter.

Moreover, the Examiner misapplied the law. The cited portion of the MPEP and the Examiner's rejection ignore that Supreme Court precedent has evolved since *Benson*. In particular, in *Bilski*, the Supreme Court recognized that:

Finally, in *Diehr*, the Court established a limitation on the principles of *Benson* and *Flook*. . . . *Diehr* explained that while an abstract idea, law of nature, or mathematical formula could not be patented, "an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of protection."

*Bilski*, 130 S. Ct. at 3230 (citing *Diehr*, 450 U.S. at 177, 187). By ignoring this important principle stated in *Diehr* and reaffirmed in *Bilski*, the Examiner again has ignored controlling Supreme Court precedent and issued a rejection not founded on sound legal principles. The correct legal analysis will be now be discussed in greater detail.

**1. The Only Exclusions From Patent-Eligibility Are "Laws Of Nature, Natural Phenomena, And Abstract Ideas."**

*Diehr* took a broad view of what constitutes a "process" and imported no extrinsic limitations to Section 101's pronouncement that processes are patentable. The Supreme Court noted that Section 101 imposes no restrictions on process patentability other than that the process be new and useful. *Diehr*, 450 U.S. at 183 (citing *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876) ("If new and useful, [a process] is just as patentable as is a piece of

machinery.”)); *see also* 35 U.S.C. § 101. The Court further noted that “Congress intended statutory subject matter to include anything under the sun that is made by man.” *Diehr*, 450 U.S. at 182 (citation omitted).

In *Diehr*, where a process was transformative, its eligibility for patenting was “not altered by the fact that in several steps of the process a mathematical equation and a programmed digital computer are used.” *Id.* at 185. Significantly, the process at issue in *Diehr* differed from the prior art only with respect to steps performed internal to the general purpose digital computer involved in the rubber-curing process. The *Diehr* Court’s allowance of such claims clearly signaled that an applicant may be entitled to patent protection even when the inventor’s contribution to the art occurs entirely within a computing device. Thus, the Court held that “a process may be patentable, irrespective of the particular form of the instrumentalities used. . . .” *Id.* at 182-83 (citation omitted).

*Diehr* was a culmination of the Court’s maturing views on computer software patenting that began first with *Benson*, 409 U.S. 63, and then *Parker v. Flook*, 437 U.S. 584 (1978). In both *Benson* and *Flook*, claims were ineligible for patenting because the applicants claimed what the Court believed to be nothing more than abstract mathematical formulas that were “like laws of nature.” In *Flook*, the Court analogized such formulas to the Pythagorean theorem. *Flook*, 437 U.S. at 590. In *Diehr*, the Court analogized such formulas to Einstein’s equation  $E=mc^2$  and Newton’s law of gravity. *Diehr*, 450 U.S. at 185. From these analogies, it is clear that the Court intended the exclusion to cover only formulas that mathematically represent laws of nature. However, in the context of computer-implemented processes, such as digital signal processing, many “formulas” are

based entirely on human ingenuity and not natural laws, and are therefore not “like laws of nature.”

*Diehr* represented the **inverse** proposition – a process that **applied** a mathematical formula **could be patentable** where the result was practical, allowing a claim to an improved curing process for rubber that used the Arrhenius equation. So long as the equation was practically applied, the process that used the equation fell outside of the narrow exclusions set forth in *Benson* and *Flook*, and the invention was patentable. The Court stated:

It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection. As Justice Stone explained four decades ago: “While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be.” (quoting *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1939)).

*Diehr*, 450 U.S. at 187-88 (emphasis in original; internal citations omitted). *Diehr* held that even a process with mathematical elements could be patent-eligible where the claim as a whole is drawn to some practical application; thus, *Diehr* was concerned with the practical applications produced by the steps in a transformative process, not the nature of the objects in those steps. The Court did not in any way limit what the objects of such patent-eligible applications could be. Nor did it need to in order to harmonize *Benson* and *Flook*. Thus, *Diehr* held that reciting mathematical steps in a claim does not negate patent-eligibility, where a practical result follows from the application of such steps. After *Diehr*, only “laws of nature, natural phenomena, and abstract ideas” were patent-ineligible. *Diehr*,

450 U.S. at 185.<sup>9</sup> Thus, *Diehr* represented a **starting point** for future invention in the realm of computer and information technology. It was not a cage with which to contain the contemporary information age.

This law remains unchanged with the Supreme Court’s recent pronouncements in *Bilski*. The Court reaffirmed in *Bilski* that “the Court’s precedents provide three exceptions to § 101’s broad patent-eligibility principle: ‘laws of nature, physical phenomena, and abstract ideas.’” *Bilski*, 130 S. Ct. at 3225 (2010) (citing *Chakrabarty*, 447 U.S. at 309). The Court reaffirmed its caution in *Diehr* that “Courts ‘should not read into the patent laws limitations and conditions which the legislature has not expressed.’” *Id.* at 3226 (citing *Diehr*, 450 U.S. at 182).

In reaching its decision in *Bilski*, the Court reaffirmed the above principles from *Diehr*:

*Diehr* explained that while an abstract idea, law of nature, or mathematical formula could not be patented, “an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.” . . . *Diehr* emphasized the need to consider the invention as a whole, rather than “dissect[ing] the claims into old and new elements and then . . . ignor[ing] the presence of the old elements in the analysis.”

*Id.* at 3230 (quoting *Diehr*, 450 U.S. at 187-8). The Court ultimately decided *Bilski* “narrowly on the basis of [its] decisions in *Benson*, *Flook*, and *Diehr*,” and concluded that *Bilski*’s claims seeking to patent both the concept of hedging risk and the application of that concept to energy markets are not patentable processes because they were attempts to patent purely abstract ideas. The *Bilski* Court therefore reaffirmed the only three

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<sup>9</sup> *Diehr* confirmed that *Benson* and *Flook* stand for “**no more**” than the exclusion of those three categories from patent eligibility. *Id.* at 185-86 (emphasis added).

exceptions to § 101's broad patent-eligibility principle: "laws of nature, physical phenomena, and abstract ideas." *Id.* at 3225.

Practical applications of digital signal processing such as those recited in the claims on appeal meet the criteria for patentability set forth in *Diehr* and *Bilski*. The manipulation of an audio signal by application of scientific principles to achieve a result that unquestionably has practical technical and commercial application is patentable irrespective of whether the process is tied to a particular machine or whether digital audio signals qualify as "articles." Consistent with the applicable statute and with the caselaw interpreting it, this strikes an appropriate balance between society's interest in creating incentives for companies to invest in research and development versus the need to preserve fundamental principles, abstract ideas and general scientific knowledge to the public. It should be as effective going forward as it has been since it was instituted three decades ago in *Diehr*.

**2. Decades Of Post-*Diehr* Federal Circuit Precedent Confirm That Data And Waveform Transformation, Including Practical Applications of Digital Signal Processing, Are Properly Patent-Eligible.**

The principles set forth in *Diehr* regarding patentable subject matter under Section 101 have proven to be just as applicable to contemporary information technology as they were to the computer-aided industrial rubber curing process that *Diehr* specifically addressed. Three decades of post-*Diehr* precedent confirm that practical applications of digital signal processing and other similar processes are similarly entitled to patent protection.

In *Abele*, the predecessor court to the Federal Circuit reviewed “an improvement in CAT scan imaging technique whereby the body [was] exposed to less radiation and, through use of a weighting function in the calculations producing the image, the artifacts [were] eliminated.” *In re Abele*, 684 F.2d 902, 904 (Ct. Cust. & Pat. App. 1982). Although an independent claim drawn to a mathematical algorithm without regard to the data source was found not to be patent-eligible, the Federal Circuit did find that a dependent claim tied to “X-ray attenuation data” was patentable. *Id.* at 908-09. The dependent claim did not recite “a mere procedure for solving a given mathematical problem.” *Id.* at 909. Rather, like in *Diehr*, the improvement “reside[d] in the application of a mathematical formula within the context of a process which encompass[e]d significantly more than the algorithm alone.” *Id.*<sup>10</sup>

In *Arrhythmia Research*, the Federal Circuit held that a mathematical analysis of a digital representation of an echocardiographic heart reading that could identify an acute arrhythmia was patentable. *Arrhythmia Research Tech., Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992). The Federal Circuit found that though there was a mathematical aspect to the invention, the **“input signals . . . [were] related to the patient’s heart function,”** the transformation of electrical signals from one form to another was itself physical, and ultimately “a signal related to the patient’s heart activity,” something manifestly physical, was the “resultant output.” *Id.* at 1059 (emphasis added). The Federal Circuit expressly noted the analogy to *Diehr*, stating “applicants ‘do not seek to patent a

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<sup>10</sup> In discussing *Abele*, the Federal Circuit suggested that the patent-eligible claim recognized a sufficient nexus to the physical world, noting that the “data clearly represented physical and tangible objects, namely the structure of bones, organs, and other body tissues.” *See Bilski*, 545 F.3d at 963 (discussing *Abele*).

mathematical formula . . . they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process.” *Id.* at 1059-60. The same is true of the currently pending claims in the instant appeal. Dolby does not seek to patent a mathematical algorithm in the abstract, but rather seeks only to foreclose from others the use of the entire combination of steps in the claimed processes.

Moreover, precisely the same sort of physicality that the Federal Circuit relied on to determine patentability in *Arrhythmia* is found in digital audio signals. Audio signals indisputably relate to sound waves that travel through the air, which, when incident on the human ear drum create the perception of sound. Audio signal processing utilizes technology such as psychoacoustics to develop technically and commercially valuable processes for operating on, transforming and synthesizing new digital audio signals. Digital audio signals therefore represent physical phenomena analogous to the echocardiographic signals that measured heart rate, which were analyzed in *Arrhythmia* and held to be patentable.

Next, *Nuijten* confirmed patent-eligibility of a process for embedding a digital watermark in a digital audio signal without comment. *In re Nuijten*, 500 F.3d 1346, 1356-57 (Fed. Cir. 2007). Claim 1 of the *Nuijten* application, which was not at issue but was mentioned by the Federal Circuit, illustrates just how well-recognized digital audio signal processing has become as a patent-eligible field.<sup>11</sup> This process claim was not tied to a

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<sup>11</sup> Claim 1 is the broadest process claim allowed. It reads:

A method of embedding supplemental data in a signal, comprising the steps of:

encoding the signal in accordance with an encoding process which includes the step of feeding back the encoded signal to control the encoding; and modifying selected samples of the encoded signal to

“particular machine,” and it operated on an audio “signal” to improve its quality. A *Bilski* footnote commented, “[w]e note that the PTO did not dispute that the *process* claims in *Nuijten* were drawn to patent-eligible subject matter under § 101 and allowed those claims.” *Bilski*, 545 F.3d at 951, n.2 (bold emphasis added).

Most recently, in *RCT*, the patents at issue claimed methods for rendering a halftone image of a digital image by comparing, pixel by pixel, the digital image against a blue noise mask. *RCT*, 627 F.3d 859. In *RCT*, the Federal Circuit cited the Supreme Court decisions in *Bilski*, *Diehr*, and *Chakrabarty* for the principle that “[t]he Supreme Court has articulated only three exceptions to the Patent Act’s broad patent-eligibility principles: ‘laws of nature, physical phenomena, and abstract ideas.’” *Id.* at 867 (citations omitted). The Federal Circuit then laid out a framework for applying this controlling precedent to process claims. In *RCT*, the Federal Circuit found the subject matter to be “a process for rendering a halftone image. As a process, the subject matter qualifies under both the categorical language of section 101 and the process definition in section 100.” *Id.* at 868. Accordingly, the Federal Circuit proceeded to examine the Supreme Court’s three exceptions.<sup>12</sup> Noting that “[t]he Supreme Court did not presume to provide a rigid formula or definition for abstractness,” the Federal Circuit did not “presume to define ‘abstract’ beyond the recognition that this disqualifying characteristic should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter and the

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represent the supplemental data prior to the feedback of the encoded signal and including the modifying of at least one further sample of the encoded signal preceding the selected sample if the further sample modification is found to improve the quality of the encoding process.

*Nuijten*, 500 F.3d at 1351.

<sup>12</sup> In *RCT*, only the abstract idea exception was at issue. *RCT*, 627 F.3d at 868.



statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act.” *Id.* In that context, the Federal Circuit found nothing abstract in the claims directed to “methods (statutory ‘processes’) for rendering a halftone image of a digital image against a blue noise mask.” *Id.*

In reaching the conclusion that claims directed to rendering a halftone image recited patentable subject matter, the Federal Circuit articulated certain principles directly relevant to the pending claims of the instant application. “Borrowing from the reasoning of the Supreme Court in *Diehr*, this court observes that the patentees here ‘do not seek to patent a mathematical formula. Instead, they seek patent protection for a process of half toning in computer applications.’” *Id.* (citing *Diehr*, 450 U.S. 175). In particular, the Federal Circuit stated that the invention at issue in *RCT* (1) “presents functional and palpable applications in the field of computer technology”; and (2) “address[es] a need in the art for a method of and apparatus for the halftone rendering of gray scale images in which a digital data processor is utilized in a simple and precise manner to accomplish the halftone rendering.” *Id.* at 868-69. The Federal Circuit further “note[d] that inventions with specific applications or improvements to technologies in the marketplace are not likely to be so abstract that they override the statutory language and framework of the Patent Act.” *Id.* at 869.

The Federal Circuit continued in *RCT*:

This court also observes that the claimed methods incorporate algorithms and formulas that control the masks and halftoning. These algorithms and formulas, even though admittedly a significant part of the claimed combination, do not bring this invention even close to abstractness that would override the statutory categories and context. The Supreme Court has already made abundantly clear that inventions incorporating and relying upon even “a well known mathematical

equation” do not lose eligibility because “several steps of the process [use that] mathematical equation.”

*Id.* (citing *Diehr*, 450 U.S. at 185).

The currently pending claims are analogous to those that were found to be patentable in *RCT*. As in *RCT*, the presently pending claims do not seek to patent a mathematical formula. Instead, they seek patent protection for a useful and practical process for generating a multichannel audio output signal based on encoded audio channels and spatial parameters. Analogous to *RCT*, the subject matter of the present claims (a method for generating a multichannel audio output signal in response to encoded audio channels and spatial parameters) has specific application and addresses needs for improvements to audio technology in the marketplace. For example, the instant application discloses different techniques for improved processing of different types of audio signals, including (1) technique 1 suitable for “signals that are substantially static spectrally, such as for example, a pitch pipe note;” (2) technique 2 suitable for “complex continuous signals that are rich in harmonics, such as massed orchestral violins;” and (3) technique 3 suitable for “complex impulsive or transient signals, such as applause, castanets, etc.” See Specification at 17:2 – 21:6. In general, these techniques and the methods of the currently pending claims have practical application to and address need in the audio signal processing art to improve audio signal processing for high-quality audio and surround sound in cinema, broadcast, home audio systems, cars, DVDs, headphones, games, televisions, and personal computers.

In light of all of these overwhelming factors, the presently pending claims are not even remotely so manifestly abstract as to override the broad statutory categories of eligible

subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act. As in *RCT*, the presently pending claims are *not even close* to the level of abstractness that would override the statutory categories and context and therefore unquestionably constitute patentable subject matter.

For at least these reasons and for the reasons stated in Section II.A above, the rejections of claims 63-74 under 35 U.S.C. § 101 should be reversed.

**3. The Rejections of Claim 74 under 35 U.S.C. § 101 as Allegedly Directed to Non-statutory Subject Matter Should Be Reversed because the Examiner has Improperly Analyzed the Apparatus Claim as a Process Claim.**

The Examiner included claim 74 in each of the two subject matter rejections discussed in Sections II.A and II.B above. *See* Final Office Action at 2-3. However, unlike claims 63-73, which are subject to the same rejections, claim 74 is not a method claim, but rather recites “[a]n apparatus comprising means adapted to carry out each of the steps of any one of the methods of claims 63-73.” The Examiner has provided no separate analysis of claim 74, and does not explain how the apparatus of Claim 74 (1) fails the machine-or-transformation test that forms the sole basis for the rejection discussed in Section II.B above; or (2) is solely directed to a mathematical algorithm without a practical application as asserted in the rejection discussed in Section II.C above. For at least these additional reasons, the rejection of claim 74 under 35 U.S.C. § 101 should be reversed.

This rejection also should be reversed because the Examiner has not properly construed the means-plus-function limitations of claim 74, and has provided no explanation

as to how claim 74 is directed to non-statutory subject matter; no analysis of the means-plus-function limitations has been provided. As has already been explained, Claim 74 is directed to “[a]n apparatus comprising means adapted to carry out each of the steps of any one of the methods of claims 63-73,” and therefore includes exclusively means-plus-function limitations under 35 U.S.C. § 112, paragraph six.

The Federal Circuit has made clear that the U.S.P.T.O. must apply 35 U.S.C. § 112, paragraph six when making its 35 U.S.C. § 101 patentable subject matter determination.

As recently explained in *In re Donaldson*, 16 F.3d 1189, 1193 (Fed. Cir. 1994), the PTO is not exempt from following the statutory mandate of § 112 P 6, which reads:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C. § 112, paragraph 6 (1988) (emphasis added). The Board majority therefore erred as a matter of law in refusing to apply § 112 P 6 in rendering its § 101 patentable subject matter determination.

*In re Alappat*, 33 F.3d 1526, 1540 (Fed. Cir. 1994) (footnote citing cases omitted). This is precisely the error the Examiner has committed in rejecting claim 74 without performing any analysis under 35 U.S.C. § 112, paragraph six. For this additional independent reason, the rejections of claims 74 under 35 U.S.C. § 101 should be reversed.

**III. All of the Rejections Under 35 U.S.C. §§ 102 and 103<sup>13</sup> Should be Reversed Because the Examiner has Misunderstood the Teachings of the Primary Reference, Faller.**

Each of the Examiner's rejections under 35 U.S.C. §§ 102 and 103 is erroneous and should be reversed because, contrary to the Examiner's assertions, the primary reference, Faller, does not teach or suggest certain limitations of independent claim 63, which by virtue of dependency or incorporation are present in each of claims 63-74. In particular, Faller fails to teach or suggest at least the following limitations present in each of the pending claims: (1) at least one of said N audio signals is a correlated signal derived from a weighted combination of at least two of said M encoded audio channels; (2) said set of spatial parameters includes a first parameter indicative of the amount of an uncorrelated signal to mix with a correlated signal; and (3) step c) includes deriving at least one uncorrelated signal from said at least one correlated signal, and controlling the proportion of said at least one correlated signal to said at least one uncorrelated signal in at least one channel of said multichannel output signal in response to one or ones of said spatial parameters, wherein said controlling is at least partly in accordance with said first parameter.

The Examiner incorrectly concluded that Faller discloses limitation (1) above, citing the following passages of Faller for support:

*(Page 525, column 2,...For obtaining a measure for the degree of correlation , the coherence estimates are averaged in each partition. For the averaging it is meaningful to apply a weighting function to the coherence before averaging. The weighting can be made proportional to the product of power estimates...which eliminates the denominator in (19). Since we are interested in the average degree of correlation in each*

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<sup>13</sup> These rejections include rejections B-D listed in the above Grounds of Rejection to be Reviewed on Appeal.

*partition and normalize it by the sum of power estimate products...)*

Final Office Action at 5. Contrary to the Examiner's characterization, the passage quoted relates to measuring the correlation between input signals to determine one of the spatial parameters, the IC (interaural correlation) or ICC (inter-channel correlation) parameter. Determining this spatial parameter has nothing to do with generating a correlated signal which is derived from a weighted combination of at least two of the M encoded audio channels. Neither the cited passage nor any other portion of Faller teaches or suggests that at least one of said N audio signals is a correlated signal derived from a weighted combination of at least two of said M encoded audio channels as required by each of the currently pending claims.

The Examiner also erroneously concluded that Faller discloses limitation (2) above, citing the following passage for support:

Page 526, column 1, ...*The estimated inter-channel cues (BCC side information) are directly used to generate the output multichannel audio signal by applying BCC synthesis . . .*

Final Office Action at 5. The Examiner also concluded that "[t]he side information (spatial parameters) are provided to give the correct cross-correlation cues to the mono signal to provide spatial perception for audio synthesis."<sup>14</sup> *Id.* However, contrary to the Examiner's conclusions, Faller makes no mention of mixing correlated and uncorrelated signals much less a parameter indicative of the amount of an uncorrelated signal to mix with a correlated signal. Faller therefore does not teach or suggest that said set of spatial parameters

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<sup>14</sup> The cited portion of Faller does not disclose this second conclusion nor does the Examiner explain how the BCC side information is provided for the stated purpose.

includes a first parameter indicative of the amount of an uncorrelated signal to mix with a correlated signal as required by each of the currently pending claims.

The Examiner further erroneously concluded that Faller discloses limitation (3) above, citing the following passage for support:

*(Page 530, column 1, ...BCC generally provides a good quality of the spatial image using only ICLDs and ICTDs as was done in the subjective test. For recordings with a high amount of uncorrelated reverberation in the audio channels, such as classical recording, it is desirable to also use ICC cues in order to restore the diffuseness of the reverberation. Informal listening revealed that the ICC synthesis does not only restore some of the diffuse reverberation, but also seems to improve the stability of the spatial image in many cases...)*

Final Office Action at 5-6. However, contrary to the Examiner's characterization, the cited portion discusses merely that some recordings have a high amount of uncorrelated reverberation and that the ICC parameter can be used to restore diffuse reverb. *See Faller*, p. 530, col. 1. Moreover, as shown in Figure 5 and described in Section II.B of Faller, a weighting factor is applied to each subband of the mono input signal to generate each output signal. The weighting factors are determined from the spatial parameters (ICLD, ICTD, and ICC). No uncorrelated signal is ever derived, and the output is not a combination of correlated and uncorrelated signals controlled in response to the spatial parameter. Neither the cited portions nor any other portion of Faller teaches or suggests (a) deriving an uncorrelated signal from the correlated signal; or (b) controlling the proportion of said at least one correlated signal to said at least one uncorrelated signal in at least one channel of said multichannel output signal in response to one or ones of said spatial parameters. The absence of either of these limitations is fatal to the Examiner's rejections – and Faller teaches or suggests *neither* of the two limitations.

The Examiner thus has failed to show where each of the above limitations of claim 63 is disclosed, either explicitly or inherently, in Faller. Each of claims 64-67 and 70-71 depends from independent claim 63 and includes limitations (1) - (3) above that are missing from Faller. Claim 74 is directed to “[a]n apparatus comprising means adapted to carry out each of the steps of any one of the methods of claims 63-73,” and therefore includes means adapted to carry out the limitations from claim 63 that are shown above to be missing from Faller. The Examiner has provided no explanation of where the claimed means are taught or suggested by Faller. Thus, the Examiner has failed to establish a *prima facie* of anticipation of claims 63-67, 70-71, and 74 over Faller. For at least the above reasons, the rejection of claims 63-67, 70-71, and 74 under 35 U.S.C. § 102(a) as allegedly anticipated by Faller should be reversed.

The rejections of (1) claims 68-69 and 73 under 35 U.S.C. § 103(a) as allegedly unpatentable over Faller in view of Baumgarte in view of Broadie; and (2) claim 72 under 35 U.S.C. § 103(a) as allegedly unpatentable over Faller in view of MPEP 2144.03 are equally deficient. Each of claims 68-69 and 72-73 depends from independent claims 63 and includes the limitations from claim 63 that are shown above to be missing from Faller. The Examiner fails to point to anything in any of the secondary references (Baumgarte, Broadie, or MPEP 2144.03) that remedies these deficiencies of Faller, and the Examiner fails to provide any justification for why it would have been obvious for one of ordinary skill in the art to modify the asserted combinations of references to include limitations (1) - (3) shown above to be missing from Faller. The Examiner has therefore failed to establish a *prima facie* case of obviousness of claims 68-69 and 72-73 over the respective asserted combinations of references. For at least these reasons, the rejections of (1) claims 68-69



and 73 under 35 U.S.C. § 103(a) as allegedly unpatentable over Faller in view of Baumgarte in view of Broadie; and (2) claims 68-69 and 73 under 35 U.S.C. § 103(a) as allegedly unpatentable over Faller in view of MPEP 2144.03 should be reversed.

Dolby submits that the foregoing reasons alone provide sufficient bases to reverse all of the rejections under 35 U.S.C. §§ 102 and 103, and that no further analysis by the Board should be necessary to reverse those prior art rejections. The additional arguments in the following sections are provided for completeness and to preserve the arguments for further appeal, should that become necessary, but need not be considered by the Board to reverse the prior art rejections in light of the above arguments. Dolby therefore respectfully requests that all rejections under 35 U.S.C. §§ 102 and 103 be reversed and the case be remanded so that a Notice of Allowance may promptly be issued for claims 63-74.

**IV. The Rejection of Claims 63-67, 70-71, and 74 under 35 U.S.C. § 102(a) as Allegedly Anticipated by Faller Should be Reversed Because Faller Does Not Teach All of the Limitations Recited in Any of Claims 63-67, 70-71, and 74.**

The Examiner rejected claims 63-67, 70-71, and 74 pursuant to 35 U.S.C. § 102(a) as allegedly anticipated by Faller. *See* Final Office Action, at pages 4-8. This rejection should be reversed, because, as explained in detail below, Faller does not disclose or suggest all of the limitations of any of claims 63-67, 70-71, and 74.

As discussed in Section III above, Faller does not disclose, either explicitly or inherently, certain limitations present in each of claims 63-67, 70-71, and 74. For those reasons alone, Faller does not anticipate claims 63-67, 70-71, and 74 and the rejection of those claims under 35 U.S.C. § 102 should be reversed. Faller also fails to disclose certain limitations of the dependent claims, which provides additional independent reasons for

reversing the anticipation rejection of those claims.

**A. Claim 64**

Claim 64 depends from claim 63 and therefore includes each of the limitations of claim 63 that are shown in Section III above not be taught, explicitly or inherently, by Faller. For those reasons alone, Claim 64 is not anticipated by Faller.

With respect to claim 64, the Examiner further erroneously found that “step c) includes deriving said at least one uncorrelated signal by applying an artificial reverberation filter to said at least one correlated signal.” Final Office Action at 6. The Examiner alleged that support for this conclusion is found in Faller as follows “(Page 525, column 1, the head related transfer functions (artificial reverberation filters) are be [sic] used to synthesize binaural signals including uncorrelated signals (Page 530, column 1).)” *Id.* However, Faller makes no mention of artificial reverberation filters, and the Examiner provides no explanation for why the head-related transfer functions meet this claim limitation nor how they are allegedly used to synthesize binaural signals including uncorrelated signals. In fact, as discussed in Section III above, Faller does not disclose, explicitly or inherently, deriving an least one uncorrelated signal from said at least one correlated signal. Faller therefore necessarily also does not teach deriving that same uncorrelated signal by applying an artificial reverberation filter to said at least one correlated signal. For at least these additional reasons, the rejection of claim 64 under 35 U.S.C. § 102 as allegedly anticipated by Faller should be reversed.

**B. Claim 65**

Claim 65 depends from claim 63 and therefore includes each of the limitations of claim 63 that are shown in Section III above not be taught, explicitly or inherently, by

Faller. For those reasons alone, Claim 65 is not anticipated by Faller. Claim 65 differs from claim 64 in that it specifies applying “a plurality of artificial reverberation filters” as opposed to “an artificial reverberation filter.” For the same reasons as stated above with respect to claim 64, Faller does not disclose, explicitly or inherently, the additional claim limitation of claim 64. For at least those additional reasons, the rejection of claim 65 under 35 U.S.C. § 102 as allegedly anticipated by Faller should be reversed.

**C. Claim 66**

Claim 66 depends from claim 65 and therefore includes each of the limitations of claim 65 that are shown in Sections III and Sections IV.B above not be taught, explicitly or inherently, by Faller. For those reasons alone, Claim 66 is not anticipated by Faller. In addition, claim 66 adds the additional claim limitation that “each of said plurality of artificial reverberation filters has a unique filter characteristic. The Examiner erroneously asserts that Faller teaches this limitation at “(Page 525, Fig. 8, ... *As a function of the source index  $I_b$  portions of different HRTF's are applied in different partitions...*).” Final Office Action at 7. The Examiner provides no explanation as to how applying different HRTFs in different partitions explicitly or inherent teaches that each of the plurality of HRTFs has a unique filter characteristic. Moreover, as discussed with respect to claim 64, the Examiner has failed to explain how the HRTFs of Faller act as artificial reverberation filters as claimed. For at least these additional reasons, the rejection of claim 66 under 35 U.S.C. § 102 as allegedly anticipated by Faller should be reversed.

**D. Claim 67**

Claim 67 depends from claim 63 and therefore includes each of the limitations of claim 63 that are shown in Section III above not be taught, explicitly or inherently, by

Faller. For those reasons alone, Claim 67 is not anticipated by Faller. In addition, claim 67 adds the additional claim limitation “wherein said controlling in step c) includes deriving a separate proportion of said at least one correlated signal to said at least one uncorrelated signal for each of a said plurality of frequency bands, at least partly in accordance with said first parameter.” The Examiner erroneously asserts that Faller teaches this additional limitation at “(Page 525, Fig. 8,... *As a function of the source index  $I_b$  portions of different HRTF's are applied in different partitions...*).” Final Office Action at 7. The Examiner provides no explanation as to how applying different HRTFs in different partitions, explicitly or inherently teaches deriving a separate proportion of said at least one correlated signal to said at least one uncorrelated signal for each of a said plurality of frequency bands, at least partly in accordance with said first parameter as claimed.

In fact, as discussed more fully in Section III above, Faller makes no mention of controlling the proportion of said at least one correlated signal to said at least one uncorrelated signal in at least one channel of said multichannel output signal in response to one or ones of said spatial parameters, wherein said controlling is at least partly in accordance with said first parameter as required by claim 63. Necessarily, Faller also does not teach, explicitly or inherently, deriving a separate proportion of the correlated signal to the uncorrelated signal as further required by claim 67. For at least these additional reasons, the rejection of claim 66 under 35 U.S.C. § 102 as allegedly anticipated by Faller should be reversed.

**V. The Rejection of Claims 68-69 and 73 Pursuant to 35 U.S.C. § 103(a) Based on the Combination of Faller in view of Baumgarte in view of Broadie Should be Reversed Because Those Claims are not Obvious over the Asserted Combination of References.**

The Examiner rejected claims 68-69 and 73 under 35 U.S.C. § 103(a) as allegedly obvious over Faller in view of Baumgarte in view of Broadie.<sup>15</sup> *See* Final Office Action, at 8-10. This rejection should be reversed, because, as explained in detail below, the combination of Faller, Baumgarte, and Broadie does not disclose or suggest all of the limitations of any of claims 68-69 and 73 and the Examiner has not provided a rational underpinning for the asserted combination of Faller, Baumgarte, and Broadie.

**A. Claims 68-69 and 73 are not rendered obvious by the combination of Faller in view of Baumgarte in view of Broadie at least because the asserted combination does not teach, suggest, or render obvious all of the limitations recited in each of those claims.**

As discussed in Section III above, the combination of Faller in view of Baumgarte in view of Broadie fails to disclose certain limitations present in each of claims 68-69 and 73. For those reasons alone, this rejection should be reversed.

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<sup>15</sup> *See* note 1, *supra*.

**B. Claims 68-69 and 73 are not obvious over Faller in view of Baumgarte in view of Broadie at least because the Examiner has failed to provide a rational underpinning for the asserted combination of references.**

The Examiner's justification for combining Baumgarte and Broadie with Faller to overcome the admitted deficiencies of Faller fails to provide sufficient rational underpinning for the asserted combination and provides an additional independent basis for reversing the rejection of claims 68-69 and 73 under 35 U.S.C. § 102 as allegedly unpatentable over Faller in view of Baumgarte in view of Broadie.

Among other observations, the Examiner concluded that "[i]t would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Baumgarte with Faller to be able to use conventional coding techniques and also provide BCC enhancement based on stereo components. (abstract)." Final Office Action at 9. The Examiner further concluded that "[i]t would have been obvious to someone of ordinary skill in the art at the time of the invention to combine Broadie with Faller and Baumgarte because all are related to spatial audio representations and Broadie's dematrixing could have replaced the standard decoding algorithm of Faller and Baumgarte prior to BCC synthesis to provide the predictable result of a stereo signal." *Id.*

However, the Examiner states only what *could* happen if Broadie was combined with the combination of Faller and Baumgarte, but provides no rational underpinning as to *how* one of ordinary skill in the art would have made the necessary combination. The Examiner also fails to explain *why* one of ordinary skill in the art would have been motivated to add the alleged dematrixing of Broadie other than "to provide the predictable result of a stereo signal." But the Examiner cites Baumgarte, figure 1 (120), ¶0027, as teaching stereo decoding that produces L and R channels and side information that further

provides high frequency information. Final Office Action at 9. If the combination of Faller and Baumgarte already teaches a stereo signal, as alleged by the Examiner, the fact that adding the alleged dematrixing of Broadie leads to a predictable result of a stereo signal provides no rational underpinning to add the third reference to the first two. One of ordinary skill in the art does not need to add the teachings of a third reference to accomplish a result that is allegedly already taught by the combination of the first two references. The Examiner thus provides no rational underpinning for why one of ordinary skill in the art would choose to modify the method of Faller to include the specific content of Baumgarte and Broadie.

The Examiner provides no further explanation of why one of ordinary skill in the art would make the suggested modifications to achieve the combination asserted against the claims of the present invention. The only teaching for modifying Faller to include deriving said N audio signals from said M encoded audio channels by a process that includes dematrixing said M encoded channels, as required by claims 68 and 69, exists in the present application, which the Examiner cannot use as a roadmap to string multiple references together to find all of the claim limitations of the present invention without relying on impermissible hindsight. Because there is thus no rational underpinning to combine Baumgarte and Broadie with Faller as suggested by the Examiner, the combination of Faller in view of Baumgarte in view of Broadie lacks rational underpinning, and the rejection should be reversed.

The Examiner thus fails to provide any articulated reasoning with a rational underpinning to support the legal conclusion of obviousness. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (requiring an explicit analysis when a conclusion of

obviousness is based on interrelated teachings of multiple patents, the effects of demands known to the design community or present in the marketplace, and the background knowledge possessed by a person having ordinary skill in the art). It is not enough merely to show that the proposed modification is allegedly known in the art. The obviousness analysis is not complete until an explanation is provided as to why one having ordinary skill in the art would have been led to apply the alleged teachings of Baumgarte and Broadie to the system and method of Faller. The Examiner has failed to provide such an explanation, and thus has failed to meet the Examiner's burden to establish a *prima facie* case over Faller in view of Baumgarte in view of Broadie with respect to claims 68-69 and 73. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992) (In rejecting claims under 35 U.S.C. § 103(a), the examiner bears the initial burden of establishing a prima facie case of obviousness. Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the appellant.); *see also* MPEP § 2142.

Moreover, because the Examiner has not articulated a sufficient justification for the proposed combination, the record does not permit adequate response or review on appeal of the Examiner's analysis. *KSR*, 550 U.S. at 418 ("To facilitate review [of a proposed justification to combine multiple references in an obviousness determination], this analysis should be made explicit.") (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.")).

In summary, the Examiner's proposed justification for combining Faller, Baumgarte, and Broadie constitutes impermissible hindsight reconstruction, and cannot



support a *prima facie* showing of obviousness. *See* MPEP § 2142 (“The tendency to resort to ‘hindsight’ based upon applicant’s disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.”) (citing references). For at least these additional independent reasons, the rejection of claims 68-69 and 73 under 35 U.S.C. 103(a) as allegedly unpatentable over Faller in view of Baumgarte in view of Broadie should be reversed.

**VI. The Rejection of Claim 72 Pursuant to 35 U.S.C. § 103(a) As Allegedly Unpatentable over Faller in View of MPEP 2144.03 Should be Reversed Because Those Claims, as Amended, are not Obvious over the Asserted Combination of References.**

The Examiner rejected claim 72 under 35 U.S.C. § 103(a) as allegedly unpatentable over Faller in view of MPEP 2144.03. *See* Final Office Action, at 10-11. This rejection should be reversed, because, as explained in detail below, the combination of Faller in view of MPEP 2144.03 does not disclose or suggest all of the limitations of claim 72 and the Examiner has not provided a rational underpinning for modification of Faller to include the missing limitations.

**A. Claim 72 is not obvious over Faller in view of MPEP 2144.03 at least because the combination of Faller and MPEP 2144.03 does not disclose or suggest that the multichannel output signal is in the frequency domain.**

As discussed in Section III above, the combination of Faller in view of MPEP 2144.03 fails to disclose certain limitations present in claim 72. For those reasons alone,

this rejection should be reversed.

In addition, the Examiner concedes that Faller fails to specifically teach “wherein said multichannel output signal is in the frequency domain.” *See* Final Office Action at 11. However, the Examiner alleges that the missing limitation would have been obvious to someone of ordinary skill in the art. *Id.* The sole prior art support cited for this conclusion is the statement in Faller that “[t]hese spectra are converted back to the time domain resulting in the multichannel output. An FFT is used as time-frequency transform (TF).” Final Office Action at 11 (citing Faller, page 523, column 1). From this statement, the Examiner extrapolates – without explanation or support – that “[t]herefore, the output was in the frequency domain prior to the FFT. It would have been obvious to someone of ordinary skill in the art at the time of the invention that the FFT could have been eliminated to transmit the signal in the frequency domain to reduce processing.” *Id.*

The quoted passage of Faller provides no support to the Examiner’s conclusion. Not only does the Examiner concede that Faller does not teach that said multichannel output signal is in the frequency domain, it in fact teaches that the multichannel output is the result of converting spectra back to the time domain. Faller, page 523, column 1. Faller specifically teaches that “[t]he sum signal to a spectral representation (time-frequency transform TF). Then as a function of the ICLDs, ICTDs, and ICCs the spectral coefficient is shown. These modified spectra are converted back to the time domain with the inverse transform ( $TF^{-1}$ ).” Faller, Figure 5 and page 523, column 1. Faller thus teaches no more than converting a sum signal to a spectral representation to scale the spectral coefficients before converting the modified spectra back to the time domain. It is only after the spectra are converted back to the time-domain that the process results in the

multichannel output, which therefore is in the time domain. Thus, Faller neither teaches nor suggests that said multichannel output signal is in the frequency domain, as required by claim 72.

MPEP 2144.03 does not salvage the Examiner's erroneous analysis. MPEP 2144.03 is entitled "Reliance on Common Knowledge in the Art of 'Well Known' Prior Art." Reliance on MPEP 2144.03 is inappropriate in this instance because the Examiner has made no assertion of common knowledge of particular facts nor does he refer to any "well known" prior art. In fact, the Examiner's rejection violates several of the principles set forth in MPEP 2144.03, including the following:

- 1) "Official notice without documentary evidence to support an examiner's conclusion is permissible only in some circumstances. While 'official notice' may be relied on, these circumstances should be rare when an application is under final rejection or action under 37 CFR 1.113."
- 2) "As noted by the court in *In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420 (CCPA 1970), the notice of facts beyond the record which may be taken by the examiner must be 'capable of such instant and unquestionable demonstration as to defy dispute' (citing *In re Knapp Monarch Co.*, 296 F.2d 230, 132 USPQ 6 (CCPA 1961))."
- 3) "If such notice is taken, the basis for such reasoning must be set forth explicitly. The examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge. See *Soli*, 317 F.2d at 946, 37 USPQ at 801; *Chevenard*, 139 F.2d at 713, 60 USPQ at 241. The applicant should be presented with the

explicit basis on which the examiner regards the matter as subject to official notice so as to adequately traverse the rejection in the next reply after the Office action in which the common knowledge statement was made.”

MPEP 2144.03. Without a specific assertion of common knowledge of particular facts or particular reference to any “well known” prior art as required by MPEP 2144.03, the Examiner has failed to state a prima facie case of obviousness of claim 72 over Faller in view of MPEP 2144.03. Such an assertion would be inappropriate in this instance, because the primary reference teaches the opposite of what the additional limitation of claim 72 requires. For at least these additional independent reasons, the rejection of claim 72 under 35 U.S.C. § 103(a) should be reversed.

**B. Claim 72 is not obvious over Faller in view of MPEP 2144.03 at least because the Examiner has failed to provide a rational underpinning for modifying Faller to include the limitation that the Examiner concedes in not specifically taught by Faller.**

Among other observations, the Examiner concluded that “[i]t would have been obvious to someone of ordinary skill in the art at the time of the invention that the FFT could have been eliminated to transmit the signal in the frequency domain to reduce processing.” *See* Final Office Action at 11. However, the Examiner provides no explanation beyond the above conclusory statement for why one of ordinary skill in the art would have been motivated to eliminate the FFT to reduce processing. This is particularly true when Faller specifically teaches that “[t]he sum signal is converted to a spectral representation (time-frequency transform TF). Then as a function of the ICLDs, ICTDs, and ICCs the spectral coefficient is shown. These modified spectra are converted

back to the time domain with the inverse transform ( $TF^{-1}$ ).” Faller, Figure 5 and page 523, column 1. Faller thus teaches no more than converting a sum signal to a spectral representation to scale the spectral coefficients before converting the modified spectra back to the time domain. Not only does the Examiner concede that Faller does not teach that said multichannel output signal is in the frequency domain, it in fact teaches that the multichannel output is the result of converting spectra back to the time domain. Faller, page 523, column 1. The only reference to the multichannel output channels refers to the time domain not the frequency domain. Thus, there is no suggestion to modify Faller for the multichannel output signal to be in the frequency domain as required by claim 72. There is no rational basis for one of ordinary skill in the art to eliminate a portion of the process taught explicitly by Faller.

The Examiner thus provides no rational underpinning for why one of ordinary skill in the art would modify Faller such that said multichannel output signal is in the frequency domain. The Examiner provides no further explanation of why one of ordinary skill in the art would make the suggested modifications to achieve the missing claim limitation of claim 72. The only teaching for modifying Faller such that said multichannel output signal is in the frequency domain, as required by claim 72, exists in the present application, which the Examiner cannot use as a roadmap to string multiple references together to find all of the claim limitations of the present invention without relying on impermissible hindsight. Because there is thus no rational underpinning to modify Faller as suggested by the Examiner, the combination of Faller in view of MPEP 2144.03 lacks rational underpinning, and the rejection should be reversed.

The Examiner thus fails to provide any articulated reasoning with a rational

underpinning to support the legal conclusion of obviousness. *See KSR*, 550 U.S. at 418. As described in Section VI.A. above, the combination of Faller in view of MPEP 2144.03 does not teach, suggest, or render obvious the limitation that said multichannel output signal is in the frequency is in the frequency domain. Even if it did, it is not enough merely to show that the proposed modification is known in the art. The obviousness analysis is not complete until an explanation is provided as to why one having ordinary skill in the art would have been led to apply modify Faller against the explicit teachings therein. The Examiner has failed to provide such an explanation, and thus has failed to meet the Examiner's burden to establish a *prima facie* case over Faller in view of MPEP 2144.03 with respect to claim 72. *In re Oetiker*, 977 F.2d at 1445; *see also* MPEP § 2142.

Moreover, because the Examiner has not articulated a sufficient justification for the proposed combination, the record does not permit adequate response or review on appeal of the Examiner's analysis. *KSR*, 127 550 U.S. at 418 ("To facilitate review [of a proposed justification to combine multiple references in an obviousness determination], this analysis should be made explicit.") (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."))

In summary, the Examiner's proposed justification for combining Faller and MPEP 2144.03 constitutes impermissible hindsight reconstruction, and cannot support a *prima facie* showing of obviousness. *See* MPEP § 2142 ("The tendency to resort to 'hindsight' based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and

the legal conclusion must be reached on the basis of the facts gleaned from the prior art.”)  
(citing references). For at least these additional independent reasons, the rejection of claim  
72 should be reversed.

**CONCLUSION**

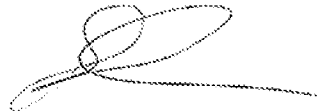
For the foregoing reasons, Dolby hereby respectfully requests that the final  
rejection of claims 63-74 be reversed.

If there is any fee due in connection with the filing of this Appeal Brief, please  
charge the fee to U.S.P.T.O. Deposit Account No. 50-4119. Moreover, should this deposit  
account contain insufficient funds, the Commissioner is hereby invited to contact Dolby’s  
undersigned representative to arrange payment.

Dated: May 9, 2011

Respectfully submitted,

BARCELÓ, HARRISON & WALKER, LLP

A handwritten signature in black ink, appearing to read 'David B. Walker', with a stylized flourish at the end.

/s David B. Walker # 43,976/

David B. Walker, Reg. No. 43,976

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**CLAIMS APPENDIX**

A complete listing of the claims:

63. A method for decoding M encoded audio channels representing N audio channels, where N is two or more, and a set of one or more spatial parameters, the method comprising:

- a) receiving said M encoded audio channels and said set of spatial parameters,
- b) deriving N audio signals from said M encoded channels, wherein each audio signal is divided into a plurality of frequency bands, wherein each band comprises one or more spectral components, and
- c) generating a multichannel output signal from the N audio signals and the spatial parameters,

whereby

M is two or more,

at least one of said N audio signals is a correlated signal derived from a weighted combination of at least two of said M encoded audio channels,

said set of spatial parameters includes a first parameter indicative of the amount of an uncorrelated signal to mix with a correlated signal and

step c) includes deriving at least one uncorrelated signal from said at least one correlated signal, and controlling the proportion of said at least one correlated signal to said at least one uncorrelated signal in at least one channel of said multichannel output signal in response to one or ones of said spatial parameters, wherein said controlling is at least partly in accordance with said first parameter.



64. The method of claim 63 wherein step c) includes deriving said at least one uncorrelated signal by applying an artificial reverberation filter to said at least one correlated signal.
65. The method of claim 63 wherein step c) includes deriving said at least one uncorrelated signal by applying a plurality of artificial reverberation filters to said at least one correlated signal.
66. The method of claim 65 wherein each of said plurality of artificial reverberation filters has a unique filter characteristic.
67. The method of claim 63 wherein said controlling in step c) includes deriving a separate proportion of said at least one correlated signal to said at least one uncorrelated signal for each of said plurality of frequency bands, at least partly in accordance with said first parameter.
68. The method of claim 63 wherein said N audio signals are derived from said M encoded audio channels by a process that includes dematrixing said M encoded audio channels.
69. The method of claim 68 wherein the dematrixing operates at least partly in response to one or ones of said spatial parameters.
70. The method of claim 63 further comprising shifting the magnitudes of spectral components in at least one of said N audio signals in response to one or ones of said spatial parameters.
71. The method of claim 63 wherein said multichannel output signal is in the time domain.
72. The method of claim 63 wherein said multichannel output signal is in the frequency domain.
73. The method of claim 63 wherein N is 3 or more.

74. An apparatus comprising means adapted to carry out each of the steps of any one of the methods of claims 63 - 73.

**EVIDENCE APPENDIX**

None

**RELATED PROCEEDINGS APPENDIX**

None